NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD

RANGE PLANTING

(Acre)

CODE 550

DEFINITION

Establishing adapted perennial vegetation such as grasses, forbs, legumes, shrubs, and trees.

PURPOSES

This practice may be applied as part of a conservation management system to accomplish one or more of the following purposes:

- Restore a plant community similar to its historic climax or the desired plant community.
- Provide or improve forages for livestock.
- Provide or improve forage, browse, or cover for wildlife.
- Reduce erosion by wind and/or water.
- Improve water quality and quantity.

CONDITIONS WHERE THIS PRACTICE APPLIES

This practice applies to land where the planned use is rangeland, native pasture, grazeable forest, and grazed wildlife land.

CRITERIA

General Criteria Applicable for All the Purposes Stated Above

Refer to Tables 1 - 15 for species, seeding rates, cultivars, and site adaptation.

Deviations from the standards and specifications can only be approved by the State Resource Conservationist (SRC).

Generally, seeding will not be needed when 15% composition by weight of the desirable plants are present, they are well distributed over the treated area, and can be managed to a stand within an acceptable time frame.

Seedbed Preparation

The seedbed shall be firm, free of weedy competition, and not have a restrictive layer such as a plowpan.

Cover Crop

The Cover Crop (340) standard and specification shall be used for guidance in establishing a cover or dead litter crop.

Managing Competitive Cover

If vegetative cover consists primarily of highly competitive and/or potentially allelopathic grasses such as silver bluestem, broomsedge bluestem, tall dropseed, sand dropseed, threeawns, fescue, or undesired introduced yellow bluestems, the area should be plowed and seeded to a noncompetitive cover Refer to Cover Crop (340) standard for a minimum of two consecutive years prior to seeding. Prescribed burning of the vegetative cover is also a tool to prevent allelopathic problems. See Prescribed Burning (338) standard and specification

Seeding Operation

Drilling Whenever possible, native grasses should be seeded with a grass drill equipped with double disk openers having depth bands followed by cultipacker, press wheels or drag chains. (Press wheels or cultipacking are preferred). Seed should be planted 1/4 to 3/4 inches deep. The distance between rows shall not exceed 12 inches.

Broadcasting Broadcasting may be used where dead litter crops are not required and the seed can be firmly anchored into the soil at a depth of 1/4 to 3/4 inch. Seedbed modification by cultipacking or other means will be needed to accomplish this. Cultipacking before and after seed placement is preferred.

Hand broadcasting is acceptable where equipment cannot be operated because of terrain, and an adequate stand of grasses can be expected on the seeded area.

Fertilizer Refer to Nutrient Management (590) standard, for guidance on fertilizing for establishment of range plantings.

Origin of Seed

The first preference for seed selection will be adapted certified named varieties, followed by adapted non-certified named varieties, then followed by common local ecotypes (local native harvest). For additional information on adaptation areas of named native cultivars, refer to Table 1, Basic Data for Calculating Range Seeding Mixtures.

Forbs and legumes listed in Table 1 are exempt from mileage and elevation requirements as long as they are listed in the ecological site description appropriate for the area to be planted.

Native Sources

The origin of native harvest grass seed shall not exceed the following guidance from the area of intended use:

- South and West - 200 to 300 miles (seed from a southern source will be given preference over seed from a northern source).
- North and East - 100 to 150 miles.
- Elevation - seed source should be not more than 2,000 feet higher or 1,000 feet lower than the planting area.
- To certify mileage and elevation requirements for native harvest, seed sources must identify the state and county of the harvest location.
- Named varieties are exempt from mileage requirements, refer to Table 1 for range of adaptability.
- Other native forbs, shrubs, and legumes may be used provided they are listed on the ecological site guide or range site technical guide in Section II of the FOTG that is appropriate for the area to be planted. Prorate the percentages in the mixture, assuming 2.0 lbs. per acre full seeding rate.

Seed Quality and Definitions

Seed analysis

Oklahoma Seed Law specifies the kind and amount of weed seed permitted, including noxious weeds; the requirements for a current analysis report; and labeling of all seed to show its purity, germination, date of last germination test, and weed seed content. Tetrazolium tests (TZ) are not allowed except for plains bristlegrass.

The germination test is valid for 9 months after the end of the month the test was made

Pure Live Seed (PLS) Determination

Seeding rates will be calculated on a pure live seed (PLS) basis unless noted otherwise.

Compute by adding percentage of germination and firm seed. Multiply this sum by purity. Divide the product by 100 for percent PLS.

$$\frac{(\%\ \text{Germ.} + \%\ \text{Firm Seed}) \times \text{Purity}}{100} = \%\ \text{PLS}$$

(Firm, hard or dormant are congruent terms)

Seeding Rates and Mixtures

Refer to the Range Planting Rates and Mixtures (Table 1 through Table 15). A sample calculation for completing range mixtures is provided following Table 15. The seeding rate is generally based on 20 PLS seeds per square foot. For wildlife plantings refer to Wildlife Upland Habitat Management (645) standard and specifications or a Wildlife Habitat Appraisal Guide for the species of concern.

All range seedings will be mixtures. Limits are set as minimum and maximum percentage for each species on each site as noted in Tables 2 - 15. Species to be planted above the minimum required is to be a decision of the land user following technical assistance from the NRCS conservationist.

Green sprangletop can be added to a full seeding rate as a filler grass, which should provide quick cover then decline as the native grasses become established. Area of adaptation provided in Tables 2, 4, 6, & 7.

Additional Criteria When Reseeding Native Range or Woodlands Following Brush Management

Seeding may be needed where there is significant (>20%) ground disturbance.

Mechanical methods to remove brush, such as dozing, rootplowing, raking, chaining and/or burning can be a part of the seedbed preparation process. Additional seedbed preparation may be needed with heavy or farm-type equipment so that seeding equipment can get over the area. If heavy equipment, such as a rootrake is used to prepare a seedbed, the rake teeth should be at least three feet long, spaced no more than twenty-four inches apart, and operated ten to twenty inches deep. A roller chopper can also be used following rootplowing to firm the seedbed and close up large cavities that would allow seed to be covered too deeply.

It may be necessary to plant cover crops (340) for two consecutive years prior to seeding to reduce resprouting brush species, especially the oaks. A technical determination will be made on the need for additional years of cover crops.

Drill or broadcast to adapted species. Seed must have mineral contact with the soil. Seed into a firm seedbed. Use aerial application only when conventional equipment or broadcasting is impractical.

Pits left from individual treedozing can be an excellent seedbed as long as the treedozing is done during the normal seeding time. In these cases, prorate the seeding rate based on the percent ground disturbance. Hand application before the soil has crusted is permissible.

On soils subject to wind erosion, cover needs should be planned to keep erosion rates down to the tolerance level of the soil to be seeded.

Other methods will be limited to special conditions with prior approval of the State Resource Conservationist (SRC).

Criteria for Determining Stand Establishment

Number of plants per square foot

Transects should be located in representative areas of the field and well distributed. One hundred readings, 3 - 5 steps apart with one-foot square quadrats are recommended for recording the plant counts. Count the total number of plants occurring within the quadrats and divide by 100 to get the number of plants per square foot. More than one transect may be needed on large fields or where stand establishment is not uniform. Delineate those areas of the planted area that do not meet establishment criteria

0 to 0.05 - *Failure.* Reapplication required.

0.05 to 0.1 - *Probable Failure*. Reapplication recommended.

0.1 to 0.5 - *Questionable.* Conservationist and producer will decide whether or not to reapply. Factors to consider are vigor of existing plants, potential to spread, extent of competition, urgency of the need to establish, weather considerations, adequacy of erosion control and desires of producer.

Over 0.5 - *Satisfactory.*

Time of Making Stand Evaluations

Determinations should be made at the end of the second growing season unless the conservationist knows the grass emerged and died during the first season, in which case the determination should be made the first year. If however, the desired population densities are met at the end of the first year, the evaluation can be made then.

Seeding Zones

Panhandle Zone - Cimarron, Texas and Beaver Counties (MLRA 77 and small part of 78).

Western Zone - Kay, Noble, Logan, Oklahoma, Cleveland, McClain, Grady, Stephens, Jefferson and all counties west of these except the Panhandle. (MLRA 78 and 80 and small part of 76 and 84).

Eastern Zone - Osage, Pawnee, Payne, Lincoln, Pottawatomie, Pontotoc, Garvin, Carter, Love and all counties east of these. (MLRA 76, 84, 112, 116, 117, 118, 119, 133 and small part of 80).

Planting Date (Statewide)

March 15 to May 1 (optimum).

December 1 to June 1 (maximum)

These seeding dates can be extended by one month with supplemental irrigation.

Management During Establishment

Seeded grasses shall not be grazed the first year following seeding and shall be deferred the following growing season if needed to insure establishment. Exceptions would be where flash grazing is used for weed control (not more than 2 weeks duration). Dormant season use is permissible as long as adequate residue is left to ensure regrowth and protect from erosion.

Generally, when 3 weeds per square foot or a 50% canopy is observed, weed control should be considered. During establishment, excessive amounts of competitive weedy plants may be controlled by the following methods:

Herbicides

Seeded species should have 3 to 5 leaves per plant before herbicides are applied unless the label states otherwise. Refer to Pest Management (595) standard.

Mowing

Weeds should be mowed when they reach a height of 6 to 8 inches. Mowing should be above the height of seeded plants. The cover crop should also be maintained. Mowing should not be done when daily maximum air temperature exceeds 95º and the humidity falls below 30% to prevent dehydration of the seedlings. Generally, mowing should not be done after July 15.

Grazing

Flash grazing by livestock may be used to control annual grasses and forbs and at a time when they are small and palatable. This method will not be used later than July 15, except when abnormal summer moisture promotes excessive weed production. Flash grazing will not be used when the soils are wet and hoof action will damage seedlings.

Flash grazing is using high concentrations of livestock to harvest palatable competitive plants in a short period of time. Should there be significant use or damage to seeded plants, the grazing should cease immediately. In cases where additional applications are needed, the procedure should be repeated soon enough to prevent the weedy vegetation from becoming tough or unpalatable.

Additional Criteria for Restoring Historic Plant Communities

Refer to the appropriate ecological site description and Tables 2 - 15 for mixtures that reflect the historic plant community. Refer to Restoring Declining Habitats (643) standard and the following job sheets:

JS550 02 - Adding Forbs and Legumes to an Existing Stand of Native Grasses

JS550 03 - Converting Monocultures of Tall Fescue to Native Plantings

JS550 04 - Converting Monocultures of Introduced Warm Season Grasses such as OWB, Bermudagrass, and Weeping Lovegrass to Native Grass

JS550 05 - Planting Native Plants

Additional Criteria for Improved Forages for Livestock

Selection of species shall be designed to meet the desired nutritional and palatability requirements during the desired season for the kind and class of livestock.

Additional Criteria for Improving Forage, Browse or Cover for Wildlife

Select species to meet dietary and palatability requirements for the intended wildlife species as well as any cover requirements.

Additional Criteria for Improved Water Quality and Quantity

A mixture of shrubs and trees indigenous to the site may be selected when riparian area, stream bank stability and water temperature criteria are important.

CONSIDERATIONS

When seeding on terraced land, a technical determination should be made concerning terrace removal prior to seeding. Terraces should be removed if:

- low places are allowing water to concentrate that prevents plant establishment,
- it is anticipated that future livestock trails will cause concentrated flow and excessive erosion,

- leaving them in place will cause poor water distribution,
- litter dams can cause overtopping, or
- water starvation will have a significant impact on the seeded species below the terraces.
- livestock are anticipated to concentrate on terraces because of higher soil fertility causing damage from spot grazing.

Generally, it is recommended to remove the terraces prior to seeding.

Forbs, legumes, and some shrubs are the quality component of livestock and wildlife diets. Adapted forbs, legumes and shrubs should be considered for inclusion into range seeding mixtures.

Because of their proven adaptability and persistence, consideration should be given to using locally native species in the mix whenever possible.

Protect from unprescribed burning.

Protect from severe insect damage where practical. Refer to Pest Management (595) standard and specifications.

The use of certified planting materials should be encouraged. However, economics, distance and source limitations on seed and plant stock should be considered.

PLANS AND SPECIFICATIONS

Specifications to be included in the conservation plan are species, percent of mixture, dates and rates of planting and other information essential to the planting. Job sheets can be used to transfer the technology. Vegetative Data Worksheet, OK-CPA-4 is available for certification. An electronic worksheet, Calculation Worksheet for Range Planting Mixtures and Costs is available at www.nrcs.usda.gov/technical/efotg, Section I.

OPERATION AND MAINTENANCE

Operation and maintenance should include provisions for grazing management, prescribed burning, brush management, and/or pest management. If there are known pest organisms present or threatening and technical recommendations are available for their control, these recommendations are to be included in the plan.

REVIEWERS:

NRCS Plant Material Specialist
NRCS Resource Specialists
NRCS State Office Specialists
ARS Range Scientists Woodward, OK
Oklahoma State University Extension
NRCS FOTG Committee

REFERENCES

Valentine, John F. 1971. Range Development and Improvements. Brigham Young University Press. Provo, Utah.

University of Nebraska, Ag. Exp. Station. 1966. A Stand Establishment Survey of Grass Plantings in the Great Plains. Great Plains Council Report No. 23. Lincoln, Nebraska.

Barton, Howard, Wayne McCully, Howard Taylor and James E. Box Jr. 1966. Influence of Soil Compaction on Emergence and First Year Growth of Seeded Grasses. Journal of Range Management, Vol. 19(3):118 -121.

Ahring, Robert M., E. C. Snook, D. Rollins. 1986. Reseeding Perennial Grasses for Erosion Control. ARS Report SPA-86-707.

Berg, William A. 1990. Native Forb Establishment and Persistence in a Grass-Forb Seeding in the Southern Plains. USDA-ARS. Woodward, Oklahoma. Proceedings of the Twelfth North American Prairies Conference, 1990, University of Northern IA., pg. 179.

Table 1 BASIC DATA FOR CALCULATING RANGE PLANTING MIXTURES [1/] [2/]

Grass Species	Area Of Adaptation [3/]	Full Seeding Rate
alkali sacaton 'Saltalk'	 Statewide	2.0
big bluestem 'Kaw' 'Rountree'	 Statewide MLRA 116A, 117, 118, 119	6.0
big sandreed	Statewide	4.0
blue grama 'Lovington' 'Hachita'	 Statewide Statewide	2.0
buffalograss 'Texoka' unhulled 'Bison'	 Statewide Statewide	6.0
eastern gamagrass 'Pete' 'Iuka'	 Statewide Except Panhandle Statewide	8.0
green sprangletop	See Tables 2, 4, 6, & 7	.5 - 1.0
Indiangrass 'Lometa' 'Cheyenne' 'Llano' 'Osage' 'Rumsey'	 Statewide Except Panhandle Statewide MLRA 70, 77 East 112, 116A, 117	4.5
little bluestem 'Aldous' 'Cimarron' 'Pastura'	 MLRA 76, 80A, 84A, 84B, 112, 116A, 133B MLRA 70, 77, 78, 80A, 84A, 84B MLRA 70, 77, 78, 80A, 84A, 84B	3.4
plains bristlegrass [4/]	West	3.0
sand bluestem 'Woodward'	 West	6.0
sand dropseed	Panhandle, West	1.0
sand lovegrass 'Mason' 'Bend'	 Statewide Statewide	1.0
sideoats grama 'El Reno' 'Haskell'	 Statewide Statewide	4.5
switchgrass 'Alamo' 'Blackwell' 'Grenville' 'Kanlow'	 Bottomlands, Sub-Irrigated, Saline Sub-Irrigated Sites Where Annual Rainfall ≥ 25 Inches. Statewide MLRA 70, 77, 78 Bottomlands Only	3.0
tall dropseed	West	1.0
western wheatgrass 'Barton'	 West	7.0

Table 1 (Continued)

Native Forbs & Shrubs	Area Of Adaptation	Full Seeding Rate
Engelmanndaisy	Statewide	4.0
Pitcher's sage	Eastern, Western	4.0
Maximilian sunflower 5/	Statewide	2.0
awnless bushsunflower	Statewide	4.0
compass plant	Eastern, Western	2.0
gayfeather	Statewide	4.0
black sampson	Statewide	2.0
pale echinacea	Eastern	2.0
upright prairie coneflower	Statewide	0.3 (2% max)
plains coreopsis	Statewide	0.3 (2% max)
four-wing saltbush	West Of I-35 Except For Sands Or Wet Sites. In MLRA 77A, 77B, ≤ WEG 86. Do not plant as a part of a mixture, plant as block or plot.	4.0 de-winged 10.0 winged

Native Legumes	INNOCULUM TYPE (SPECIES SPECIFIC)	AREA OF ADAPTATION	FULL SEEDING RATE (PLS LB./AC)
leadplant	Amorpha Spec 1	Statewide	2.0
tephrosia	Tephrosia Spec 1	Statewide	4.0
prairie clover	F	Statewide	4.0
Illinois bundleflower	Desmanthus Spec 1	Statewide	4.0
roundhead lespedeza	EL	Eastern, Western	2.0
tickclover	EL	Statewide	2.0
trailing wildbean	Strophostyles Spec 1	Statewide	2.0
western indigo	EL	Statewide	2.0
catclaw sensitivebriar	Amorpha Spec 1	Statewide	2.0
prairie acacia	EL	Statewide	2.0
partridge pea	EL	Statewide	4.0
least snoutbean	Rynchosia Spec 1	Statewide	2.0
other legumes	Use appropriate	Statewide	2.0

1/ Based on full seeding rate of Pure Live Seed (PLS) per acre.

2/ Mixtures meet specifications when planted at not more than 5% below or 25% above the full rate for each species.

3/ Cultivars are only approved if the species for that cultivar is listed in Tables 2 - 15. The seeding rates for the cultivars are the same as those for the species.

4/ Tetrazolium tests (TZ) are approved for seed quality analysis.

5/ Do not exceed .1 lb. Maximilian sunflower per acre in mixture.

Table 2 PANHANDLE [6/] [7/]

Ecological Sites: loamy prairie, sandy plains, limy sandy plains, loamy plains, mixedland slopes, and limy uplands

GRASS SPECIES	MIN. PERCENT	MAX. PERCENT
little bluestem	0	20
sand bluestem	0	40
switchgrass	0	30
Indiangrass	0	40
Must include at least one of the above and total	**15**	**60**
sideoats grama	25	60
blue grama	10	40
buffalograss	0	20
sand lovegrass	0	20
sand dropseed	0	10
western wheatgrass	0	10
plains bristlegrass [8/]	0	10
forbs, legumes and/or shrubs	0	10

[6/] Green sprangletop can be added at .5 to 1.0 lbs. per acre as a filler grass.
[7/] Minimum and maximum percent of full seeding rate from Table 1.
[8/] Plains bristlegrass can be included for wildlife purposes.

Table 3 PANHANDLE [7/]

Ecological sites: deep sand, sandy bottomland, and dune

GRASS SPECIES	MIN. PERCENT	MAX. PERCENT
little bluestem	10	40
sand bluestem	10	40
Indiangrass	0	20
switchgrass	10	30
Minimum of total of above	**40**	**75**
sideoats grama	0	30
blue grama	0	25
sand lovegrass	10	20
sand dropseed	0	10
big sandreed	0	20
forbs, legumes and/or shrubs	0	10

[7/] Minimum and maximum percent of full seeding rate from Table 1.

Table 4 PANHANDLE [6/] [7/]

Ecological sites: hardland, shallow, very shallow

GRASS SPECIES	MIN. PERCENT	MAX. PERCENT
little bluestem	0	25
sand bluestem	0	15
Indiangrass	0	15
switchgrass	0	15
sideoats grama	25	60
blue grama	20	50
buffalograss	0	20
Must include three of above	**60**	**100**
sand lovegrass	0	10
western wheatgrass [9/]	0	25
forbs and legumes	0	10

[6/] Green sprangletop can be added at .5 to 1.0 lbs. per acre as a filler grass.

[7/] Minimum and maximum percent of full seeding rate from Table 1.

[9/] Hardland sites only.

Table 5 PANHANDLE [7/]

Ecological sites: loamy bottomland, heavy bottomland, moderately saline, subirrigated

GRASS SPECIES	MIN. PERCENT	MAX. PERCENT
little bluestem [10/]	10	30
sand bluestem [10/]	10	30
Indiangrass	0	20
switchgrass	10	40
Mixture total	**40**	**100**
blue grama [13/]	0	10
tall dropseed	0	10
alkali sacaton [11/]	0	40
eastern gamagrass [12/]	0	25
western wheatgrass	0	20
buffalograss [13/]	0	5
sideoats grama [13/]	0	10
forbs and legumes	0	10

[7/] Minimum and maximum percent of full seeding rate from Table 1.

[10/] Not required on moderately saline, subirrigated, wet meadow, or wetland type sites.

[11/] Applicable to moderately saline and alkali areas only.

[12/] Applicable only to subirrigated or wetland type sites.

[13/] Only on loamy bottomland and heavy bottomland.

Table 6. WESTERN [6/] [7/]

Ecological sites: loamy, loamy prairie, limy prairie, sandy plains, mixedland slopes, sandy prairie, limy sandy plains, loamy plains, blackclay prairie, sandy savanna, loamy savanna, eroded prairie, eroded sandy savanna, eroded savanna

GRASS SPECIES	MIN. PERCENT	MAX. PERCENT
little bluestem	15	30
big or sand bluestem	10	40
Indiangrass	10	40
switchgrass	10	25
sideoats grama	10	50
blue grama	10	30
buffalograss	0	20
sand lovegrass	0	10
tall dropseed	0	10
plains bristlegrass [8/]	0	10
western wheatgrass	0	10
forbs and legumes	0	10

[6/] Green sprangletop can be added at .5 to 1.0 lbs. per acre as a filler grass.

[7/] Minimum and maximum percent of full seeding rate from Table 1.

[8/] Plains bristlegrass can be added for wildlife purposes.

Table 7 WESTERN [7/] [14/]

Range sites: deep sand, deep sand savanna, sandy bottomland, and dune

GRASS SPECIES	MIN. PERCENT	MAX. PERCENT
little bluestem	15	30
big or sand bluestem	15	40
Indiangrass	10	25
switchgrass	10	40
Mixture total of above	**50**	**80**
sideoats grama	0	25
blue grama	0	15
sand lovegrass	10	20
tall dropseed	0	10
big sandreed	0	20
forbs and legumes	0	10

[7/] Minimum and maximum percent of full seeding rate from Table 1.

[14/] Dune site may not be practical to revegetate.

Table 8 WESTERN [6/] [7/]

Ecological sites: claypan prairie, red clay prairie, very shallow, shallow claypan, shallow prairie, hardland, shallow, red clay flats, gravelly sandy, red shale, shallow clay prairie, shallow savanna, eroded clay, eroded shallow savanna, edgerock

GRASS SPECIES	MIN. PERCENT	MAX. PERCENT
little bluestem	10	40
big or sand bluestem	0	25
Indiangrass	0	20
switchgrass	0	25
sideoats grama	10	60
Mixture total of above	**40**	**80**
blue grama	10	35
buffalograss	0	20
sand lovegrass	0	10
western wheatgrass [15/]	0	20
alkali sacaton [15/]	0	50
forbs and legumes	0	10

[6/] Green sprangletop can be added at .5 to 1.0 lbs. per acre as a filler grass.

[7/] Minimum and maximum percent of full seeding rate from Table 1.

[15/] Clay or claypan sites only.

Table 9 WESTERN [7/]

Ecological sites: loamy bottomland, heavy bottomland, moderately saline, subirrigated, wet meadow

GRASS SPECIES	MIN. PERCENT	MAX. PERCENT
little bluestem [10/]	10	30
sand or big bluestem [10/]	10	30
Indiangrass	0	30
switchgrass [16/]	10	30
Mixture total of above	**50**	**100**
blue grama [13/]	0	10
tall dropseed	0	10
alkali sacaton [11/]	0	40
eastern gamagrass	0	25
western wheatgrass	0	20
buffalograss [13/]	0	5
sideoats grama [13/]	0	10
forbs and legumes	0	10

[7/] Minimum and maximum percent of full seeding rate from Table 1.

[10/] Not required on moderately saline, subirrigated, wet meadow, or wetland type sites.

[11/] Applicable to moderately saline and alkali areas only.

[13/] Only on loamy bottomland and heavy bottomlands.

[16/] Increase min. to 30% and max. to 70 % on sub-irrigated or wet meadow type sites.

Table 10 WESTERN [7/]

Ecological sites: alkali bottomland, saline subirrigated, and slickspot

GRASS SPECIES	MIN. PERCENT	MAX. PERCENT
little bluestem	0	20
sand or big bluestem	0	20
Indiangrass	0	20
switchgrass	10	30
tall dropseed	0	10
alkali sacaton	10	50
western wheatgrass	10	30
sideoats grama [17/]	10	25
blue grama [17/]	10	25
buffalograss	0	20
forbs and legumes	0	10

[7/] Minimum and maximum percent of full seeding rate from Table 1.

[17/] Not required on saline subirrigated or alkali bottomland.

Table 11 EASTERN [7/]

Ecological sites: loamy prairie, sandy prairie, limy prairie, blackclay prairie, sandy savanna, loamy savanna, eroded prairie, eroded sandyland, eroded sandy savanna, and eroded savanna

GRASS SPECIES	MIN. PERCENT	MAX. PERCENT
little bluestem	10	30
big bluestem	15	35
Indiangrass	10	30
switchgrass	5	20
sideoats grama	5	10
Minimum Total	**80**	**100**
blue grama	0	15
buffalograss	0	5
tall dropseed	0	5
western wheatgrass	0	10
eastern gamagrass	0	20
forbs and legumes	0	10

[7/] Minimum and maximum percent of full seeding rate from Table 1.

Table 12 EASTERN [7/] [14/]

Ecological sites: deep sand, deep sand savanna, sandy bottomland, and dune

GRASS SPECIES	MIN. PERCENT	MAX. PERCENT
little bluestem	10	25
big bluestem	15	30
Indiangrass	15	30
switchgrass	10	20
Minimum Total	**70**	**100**
sideoats grama	0	10
sand lovegrass	10	20
tall dropseed	0	10
big sandreed	0	20
forbs and legumes	0	10

[7/] Minimum and maximum percent of full seeding rate from Table 1.

[14/] Dune site may not be practical to revegetate.

Table 13 EASTERN [7/]

Ecological sites: claypan prairie, red clay prairie, very shallow, shallow claypan, shallow prairie, shallow, shallow clay prairie, shallow savanna, claypan savanna, eroded clay, eroded shallow savanna

GRASS SPECIES	MIN. PERCENT	MAX. PERCENT
little bluestem	20	50
big bluestem	0	25
Indiangrass	0	20
switchgrass	0	20
sideoats grama	10	30
Mixture Total	**50**	**100**
blue grama	0	10
buffalograss	0	20
tall dropseed	0	10
alkali sacaton [18/]	0	80
forbs and legumes	0	10

[7/] Minimum and maximum percent of full seeding rate from Table 1.

[18/] Applicable to shallow claypan.

Table 14 EASTERN [7/]

Ecological sites: loamy bottomland, heavy bottomland, moderately saline, subirrigated, wet meadow

GRASS SPECIES	MIN. PERCENT	MAX. PERCENT
little bluestem [10/]	10	30
big bluestem [10/]	20	40
Indiangrass	10	30
switchgrass [16/]	10	30
Mixture Total	**60**	**100**
tall dropseed	0	10
alkali sacaton [11/]	0	20
eastern gamagrass	0	25
western wheatgrass	0	20
sideoats grama [13/]	0	10
forbs and legumes	0	10

[7/] Minimum and maximum percent of full seeding rate from Table 1.

[10/] Not required on subirrigated, wet meadow, or wetland type sites.

[11/] Applicable to moderately saline and alkali areas only.

[13/] Only on loamy bottomland and heavy bottomland.

[16/] Increase min. to 30% and max. to 70% on subirrigated or wet meadow type sites.

Table 15 EASTERN [7/]

Ecological sites: alkali bottomland, saline subirrigated, and slickspot

GRASS SPECIES	MIN. PERCENT	MAX. PERCENT
little bluestem	0	20
big bluestem	0	20
Indiangrass	0	20
switchgrass	20	40
tall dropseed	0	10
alkali sacaton	0	50
western wheatgrass	0	30
sideoats grama [17/]	10	25
blue grama	0	20
buffalograss	0	20
forbs and legumes	0	10

[7/] Minimum and maximum percent of full seeding rate from Table 1.

[17/] Not required on saline subirrigated or alkali bottomland.

SAMPLE CALCULATION FOR COMPUTING RANGE MIXTURES

SPECIES	SEEDING RATE	% OF MIX	LBS PLS / AC	TOTAL ACRES	TOTAL PLS
little bluestem	3.4	25	0.85	80	68
Indiangrass	4.5	25	1.12	80	90
sideoats grama	4.5	30	1.35	80	108
switchgrass	3.0	10	0.3	80	24
Illinois bundleflower	4.0	10	0.4	80	32
	TOTAL	**100**			

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